

MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE. Assistant Editor: H. H. KIMBALL.

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INTRODUCTION.

The MONTHLY WEATHER REVIEW for March, 1903, is based on data from about 3300 stations, classified as follows:

Weather Bureau stations, regular, telegraph and mail, 160; West Indian service, cable and mail, 8; River and Flood service, 52, river and rainfall, 177, rainfall only 62; voluntary observers, domestic and foreign, 2565; total Weather Bureau Service, 2962; Canadian Meteorological Service, by telegraph and mail, 20, by mail only, 13; Meteorological Service of the Azores, by cable, 2; Meteorological Office, London, by cable, 8; Mexican Telegraph Company, by cable, 3; Army Post Hospital reports, 18; United States Life-Saving Service, 9; Southern Pacific Company, 96; Hawaiian Meteorological Service, 75; Jamaica Weather Service, 130; Costa Rican Meteorological Service, 25; The New Panama Canal Company, 5; Central Meteorological Observatory of Mexico, 20 station summaries also printed daily bulletins and charts, based on simultaneous observations at about 40 stations; Mexican Federal Telegraph Service, printed daily charts, based on about 30 stations.

Special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada; Mr. Curtis J. Lyons, Territorial Meteorologist, Honolulu, H. I.; Señor Manuel E. Pastrana, Director of the Central Meteorological and Magnetic Observatory of Mexico; Camilo A. Gonzales, Director-General of Mexican Telegraphs; Capt. S. I. Kimball, Superintendent of the United States Life-Saving Service; Lieut. Commander W. H. H. Southerland, Hydrographer, United States Navy; H. Pittier, Director of the Physico-Geographic Institute, San José,

Costa Rica; Commandant Francisco S. Chaves, Director of the Meteorological Service of the Azores, Ponta Delgada, St. Michaels, Azores; W. M. Shaw, Esq., Secretary, Meteorological Office, London; Rev. Josef Algué, S. J., Director, Philippine Weather Service; and H. H. Cousins, Chemist, in charge of the Jamaica Weather Office.

Attention is called to the fact that the clocks and self-registers at regular Weather Bureau stations are all set to seventy-fifth meridian or eastern standard time, which is exactly five hours behind Greenwich time; as far as practicable, only this standard of time is used in the text of the REVIEW, since all Weather Bureau observations are required to be taken and recorded by it. The standards used by the public in the United States and Canada and by the voluntary observers are believed to conform generally to the modern international system of standard meridians, one hour apart, beginning with Greenwich. The Hawaiian standard meridian is $157^{\circ} 30'$, or $10^{\text{h}} 30^{\text{m}}$ west of Greenwich. The Costa Rican standard of time is that of San José, $0^{\text{h}} 36^{\text{m}} 13^{\text{s}}$ slower than seventy-fifth meridian time, corresponding to $5^{\text{h}} 36^{\text{m}}$ west of Greenwich. Records of miscellaneous phenomena that are reported occasionally in other standards of time by voluntary observers or newspaper correspondents are sometimes corrected to agree with the eastern standard; otherwise, the local standard is mentioned.

Barometric pressures, whether "station pressures" or "sea-level pressures," are now reduced to standard gravity, so that they express pressure in a standard system of absolute measures.

FORECASTS AND WARNINGS.

By Prof. E. B. GARRIOTT, in charge of Forecast Division.

Gales of unusual winter intensity, due to persistent low barometric pressure over the British Isles, prevailed over the eastern Atlantic and the western European coasts during a great part of the month. In the United States the month was notably free from severe gales.

During the second decade of the month abnormally high temperatures prevailed east of the Rocky Mountains, and the highest temperatures on record for the season were recorded at a number of points in the northeastern districts.

The monthly precipitation was unusually heavy in the interior of the Atlantic coast States, in the west Gulf coast districts, in California, and the interior of Washington.

High water in the rivers inundated much valuable land in the lower Mississippi Valley.

The only severe storm of the month on the Atlantic coast advanced from Florida to the Canadian Maritime Provinces from the 29th to the 31st. This storm increased in intensity as it advanced northeastward, and showed central barometric pressure below 29.40 inches on the southeast coast of New England on the morning of the 31st, and a reading of 29.22 inches at Sydney, C. B. I., at the evening report of the 31st.

No general storms of marked strength were reported on the coasts of the Gulf of Mexico. On the 18th and 19th, however, strong easterly, shifting to northerly, winds occurred on the Texas coast, attending the passage of a barometric disturbance southeastward over Texas.

High winds occurred on the lower Lakes on the 7th. On the 19th and 20th a disturbance moved east-northeastward over the Lake region, causing wind velocities of 48 miles an hour at Chicago, Ill., and Buffalo, N. Y. During the 23d a barometric disturbance developed over Lake Michigan and moved thence northeastward, attended by gales over the Great Lakes.

High winds prevailed on the extreme north Pacific coast from the 6th to the 10th, with maximum velocities of 90 miles at North Head and 68 miles an hour at Tatoosh Island, Wash., on the 10th. On the 27th the wind was high on the Washington coast, and gales were reported on the 30th on the northern California, Oregon, and Washington coasts.

Timely and ample warning was given of all gales that visited the sea coasts and Great Lakes of the United States.

The cold periods of the month were neither severe nor prolonged. On the 1st the temperature was below zero in southwestern Kansas and heavy frost occurred in central and northern Texas and northwestern Louisiana. On the 6th light frost was reported in the San Joaquin Valley, Cal., and by the morning of the 7th the frost line had extended to Los Angeles, Cal. From the 18th to the 21st a cold wave of moderate intensity advanced from the British Northwest Territory over the Western and Northwestern States, attended on the 21st by heavy frost in northern Texas and northwestern Arkansas. On the 18th heavy frost occurred in the Sacramento Valley